



#7

1/7

Nucleotide sequence of the entire envelope gene for the mutant HBsAg strain:

ATGGGGCAGAATCTTTCCACCAGCAATCCTCTGGGATTCTTTCCCGACCACCAGTTGGAT
CCAGCCTTCAGAGCAAACACCAACAATCCAGATTGGGACTTCAATCCCAACAAGGACAC
CTGGCCAGACGCCAACAAGGTAGGAGCTGGAGCATTGGGACTGGGGTTCACCCCACCGC
ACGGAGGCCTTTTGGGGTGGAGCCCTCAGGCTCAGGGCATAACACAAACCTTGCCAGCA
AATCCGCCTCCTGCTTCCACCAATCGCCAGTCAGGAAGGCAGCCTACCCCGCTGTCTCCA
CCTTTGAGAAACACTCATCCTCAAGCCATGCAGTGGAAGTCCACAACCTTCCACCAAACCT
CTGCAAGATCCCAGAGTGAGAGGTCTGTATTTCCCTGCTGGTGGCTCCAGTTCAGGAACAG
TAAACCCTGTTCCGACTACTGTCTCTCCCATATCGTCAATCTTCTCGAGGATTGGGGACC
CTGCGCGGAACATGGAGAACATCACATCAGGATTCTAGGACCCCTGCTCGTGTTACAG
GCGGGGTTTTTCTTGTTGACAAGAATCCTCACAATACCGCAGAGTCTAGACTCGTGGTG
GACTTCTCTCAATTTTCTAGGGGGAAGTACCGTGTGTCTTGGCCAAAATTCGCAGTCCC
CAACCTCCAATCACTACCAACCTCCTGTCCTCCAAGTGTCTGCTGGTTATCGCTGGATGT
GTCTGCGGCGTTTTATCATCTTCTCTTCATCCTGCTGCTATGCCTCATCTTCTTGTGGT
TCTTCTGGACTATCAAGGTATGTTGCCGTTTGTCTCTAATTCCAGGATCTTCAACCAC
CAGCACGGGACCATGCAGAGCCTGCACGACTCCTGCTCAAGGAACCTCTATGTATCCCT
CCTGTTGCTGTACAAAACCTTCGGATGGAACTGCACCTGTATTCCCATCCCATCATCCT
GGGCTTTCGGAAAATTCCTATGGGAGTGGGCCTCAGCCCGTTTCTCCTGGCTCAGTTTAC
TAGTGCCATTTGTTCAAGTGGTTCGTAGGGCTTTCCTCCCACTGTTTGGCTTTCAGTTATATG
GATGATGTTGTACTGGGGGCCAAGTCTGTACACCATCTTGAGTCCCTTTTTACCGCTGTT
ACCAATTTTCTTTTGTCTTTGGGTATACATTTAAACCCTAATAAA

FIG. 1

092187-0940

2/7

Amino acid sequence of the entire envelope gene for the mutant HBV strain:

[preS1]MQQNLSTSNPLGFFPDHQLDPAFRANTNNPDWDFNPNKDTWPDANKVGAGAFGL
GFTPPHGGLLGWSPQAQGITQTL PANPPPASTNRQSGRQPTPLSPPLRNTHPQA

[preS2]MQWNSTTFHQTLDPRVRGLYFPAGSSSGTVNPVPTTVSPISSIFSRIGDPARN

[S]M₁ENITSGFLG₁₀PLLVLQAGFF₂₀LLTRILTIPQ₃₀SLDSWWTSLN₄₀FLGGTTVCLG₅₀QNSQS
PTSNH₆₀SPTSCPPTCP₇₀GYRWMCLRRF₈₀IIFLFI₉₀LLVLLDY₁₀₀QGMLPVCPLI₁₁₀PGS
STTSTGP₁₂₀CRAC₁₂₃TTPAQG₁₃₀TSMYPSCCCT₁₄₀KPSDGNCTCI₁₅₀PIPSSWAFGK₁₆₀FLWEWASA
RF₁₇₀SWLSLLVPFV₁₈₀QW₁₈₉FGLSPTV₁₉₀WLSVIWMM₂₀₀YWG₂₀₇PSLYTILS₂₁₀PFLPLLPIFF₂₂₀CL
WVYI.

subtype ayw2, genotype D

Three S substitutions found:

- 1.) Thr to Ala 123 (affects H166 epitope)
- 2.) Trp to Leu 199 (outside "a" determinant)
- 3.) Ser to Thr 207 (outside "a" determinant)

FIG.2

093187-09401
10-250-28360

Nucleotide sequence of the small envelope gene for wild type HBV ayw₂:

ATGGAGAACATCACATCAGGATTCCTAGGACCCCTGCTCGTGTTACAGGCGGGGTTTT
TCTGGTTGACAAGAATCCTCACAATACCGCAGAGTCTAGACTCGTGGTGGACTTCTCTC
AATTTTCTAGGGGGAACCTACCGTGTGTCTTGGCCAAAATTCGCAGTCCCCAACCTCCAA
TCACTCACCAACCTCCTGTCCTCCAACCTTGTCTGGTTATCGCTGGATGTGTCTGCGGC
GTTTTATCATCTTCCTCTTCATCCTGCTGCTATGCCTCATCTTCTTGTTGGTTCTTCTGGA
CTATCAAGGTATGTTGCCCGTTTGTCTCTAATTCCAGGATCATCAACCACCAGCACGG
GACCCCTGCAGAACCTGCACGACTCCTGCTCAAGGAACCTCTATGTATCCCTCCTGTTGC
TGTACAAAACCTTCGGATGGAAACTGCACCTGTATTCCCATCCCATCATCCTGGGCTTT
CGGAAAATTCCTATGGGAGTGGGCCTCAGCCCGTTTCTCTTGGCTCAGTTTACTAGTGC
CATTTGTTCAGTGGTTCGTAGGGCTTTCCCCACTGTTTGGCTTTCAGTTATATGGATGA
TGTGGTATTGGGGGCCAAGTCTGTACAGCATCTTGAGTCCCTTTTTACCGCTGTTACCA
ATTTTCTTTTGTCTTTGGGTATACATTTAA

FIG.3

Translated nucleotide sequence of the small envelope gene for the mutant HBV strain (1st sequence) and for wild type ayw₂ (third sequence). Differences in sequence are underlined.

S sequence-->

```

CGG CGG AAC ATG GAG AAC ATC ACA TCA GGA TTC CTA GGA CCC CTG CTC GTG TTA CAG GCG
A  R  N  M  E  N  I  T  S  G  F  L  G  P  L  L  V  L  Q  A
CGG CTG AAC ATG GAG AAC ATC ACA TCA GGA TTC CTA GGA CCC CTG CTC GTG TTA CAG GCG

GGG TTT TTC TTG ACA AGA ATC CTC ACA ATA CCG CAG AGT CTA GAC TCG TGG TGG ACT
G  F  L  L  T  R  I  L  T  I  P  Q  S  L  D  S  W  W  T
GGG TTT TTC TTG ACA AGA ATC CTC ACA ATA CCG CAG AGT CTA GAC TCG TGG TGG ACT

TCT CTC AAT TTT CTA GGG GGA ACT ACC GTG TGT TGT CTT GGC CAA AAT TCG CAG TCC CCA ACC
S  L  N  F  L  G  G  T  T  V  C  L  G  Q  N  S  Q  S  P  T
TCT CTC AAT TTT CTA GGG GGA ACT ACC GTG TGT TGT CTT GGC CAA AAT TCG CAG TCC CCA ACC

TCC AAT CAC TCA CCA ACC TCC TGT CCT CCA ACT TGT CCT GGT TAT CGC TGG ATG TGT CTG
S  N  H  S  P  T  S  C  P  T  C  P  G  Y  R  W  M  C  L
TCC AAT CAC TCA CCA ACC TCC TGT CCT CCA ACT TGT CCT GGT TAT CGC TGG ATG TGT CTG

CGG CGT TTT ATC ATC TTC CTC TTC ATC CTG CTG CTA TGC CTC ATC TTC TTG TTG GTT CTT
R  R  F  I  I  F  L  F  I  L  L  L  C  L  I  F  L  L  V  L
CGG CGT TTT ATC ATC TTC CTC TTC ATC CTG CTG CTA TGC CTC ATC TTC TTG TTG GTT CTT

CTG GAC TAT CAA GGT ATG TTG CCC GTT TGT CCT CTA ATT CCA GGA TCI TCA ACC ACC AGC
L  D  Y  Q  G  M  L  P  V  C  P  L  I  P  G  S  S  T  T  S
CTG GAC TAT CAA GGT ATG TTG CCC GTT TGT CCT CTA ATT CCA GGA TCA TCA ACC ACC AGC

ACG GGA CCA TGC AGA GCC TGC ACG ACT CCT GCT CAA GGA ACC TCT ATG TAT CCC TCC TGT
T  G  P  C  R  A  C  T  T  P  A  Q  G  T  S  M  Y  P  S  C
ACG GGA CCC TGC AGG ACC TGC ACG ACT CCT GCT CAA GGA ACC TCT ATG TAT CCC TCC TGT
I

```

FIG.4A

TGC TGT ACA AAA CCT TCG GAT GGA AAC TGC ACC TGT ATT CCC ATC CCA TCA TCC TGG GCT
C C T K P S D G N C T C I P I P S S W A
TGC TGT ACA AAA CCT TCG GAT GGA AAC TGC ACC TGT ATT CCC ATC CCA TCA TCC TGG GCT

TTC GGA AAA TTC CTA TGG GAG TGG GCC TCA GCC CGT TTC TCC TGG CTC AGT TTA CTA GTG
F G K F L W E W A S A R F S W L S L L V
TTC GGA AAA TTC CTA TGG GAG TGG GCC TCA GCC CGT TTC TCI TGG CTC AGT TTA CTA GTG

CCA TTT GTT CAG TGG TTC GTA GGG CTT TCC CCC ACT GTT TGG CTT TCA GTT ATA TGG ATG
P F V Q W F V G L S P T V W L S V I W M
CCA TTT GTT CAG TGG TTC GTA GGG CTT TCC CCC ACT GTT TGG CTT TCA GTT ATA TGG ATG

ATG TIG TAC TGG GGG CCA AGT CTG TAC ACC ATC TTG AGT CCC TTT TTA CCG CTG TTA CCA
M L Y W G P S L Y I I L S P F L P L P
ATG TGG TAT TGG GGG CCA AGT CTG TAC AGC ATC TTG AGT CCC TTT TTA CCG CTG TTA CCA
W S

ATT TTC TTT TGT CTT TGG GTA TAC ATT TAA
I F C L W V Y I
ATT TTC TTT TGT CTT TGG GTA TAC ATT TAA

FIG. 4B

Nucleotide sequence 492 to 675 encoding the "a" determinant for the mutant HBV strain.

T₄₉₂ AT CAA GGT ATG TTG CCC GTT TGT CCT CTA ATT CCA GGA TCT TCA ACC ACC AGC
ACG GGA CCA TGC AGA G₅₆₁CC TGC ACG ACT CCT GCT CAA GGA ACC TCT ATG TAT CCC TCC TGT
TGC TGT ACA AAA CCT TCG GAT GGA AAC TGC ACC TGT ATT CCC ATC CCA TCA TCC TGG GCT
TTC GGA AAA₆₇₅

FIG.5

Amino acid sequence of the "a" determinant for the mutant HBV strain:

Y₁₀₀QGMLPVCPLI₁₁₀PGSSTTSTGP₁₂₀CRACTTPAAG₁₃₀TSMYPSCCCT₁₄₀
KPSDGNCTCI₁₅₀PIPSSWAFGK₁₆₀

FIG.6